Blakely, Sokoloff, Taylor & Zafman LLP (503) 684-6200
Title: METHOD AND APPARATUS FOR REGISTER STACK
IMPLEMENTATION USING MICRO-OPERATIONS
1st Named Inventor: Edward T. Grochowski
Express Mail No.: EV325527927US Docket No.: 42P15758
Sheet: 1 of 11

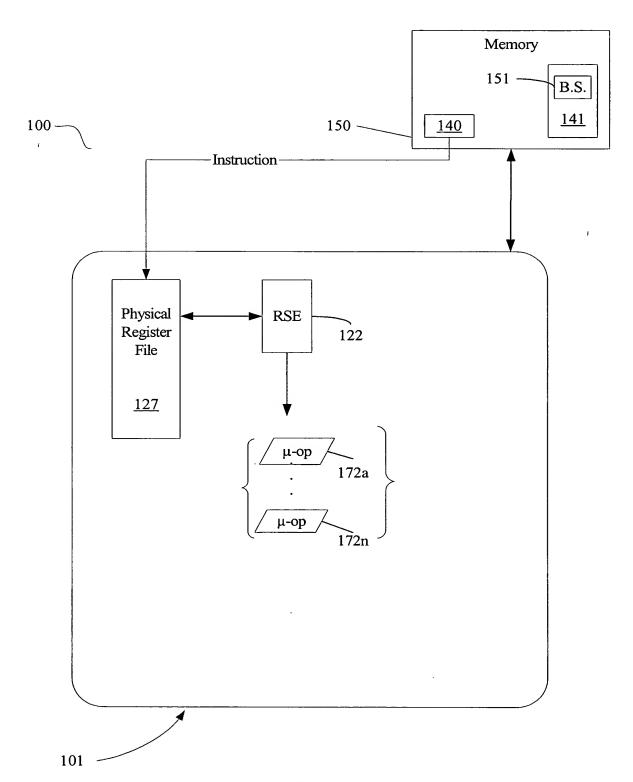


Fig. 1

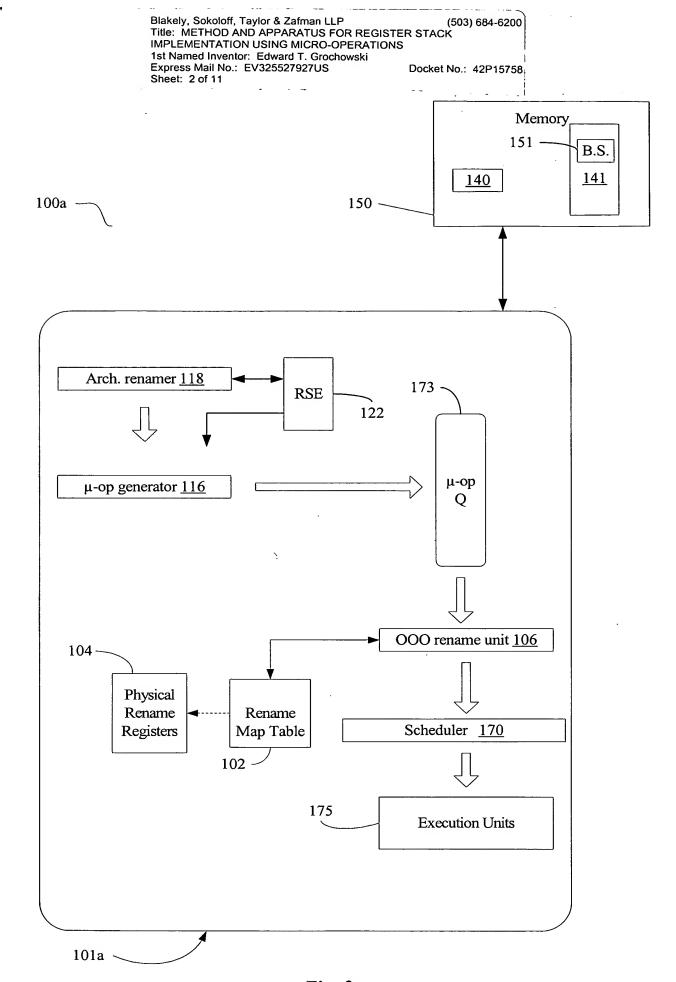


Fig. 2

Dispatch 312 Retire 314 Phys. Rename 311 Blakely, Sokoloff, Taylor & Zafman LLP
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Sheet: 3 of 11 Execute 313 Generation U-op 310 Arch. Rename RSE 308 122 / Decode 306 IP generation Fetch 302 304

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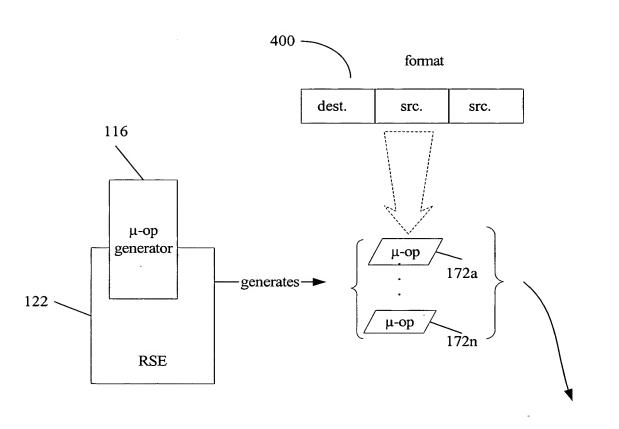


Fig. 4

to instruction pipeline

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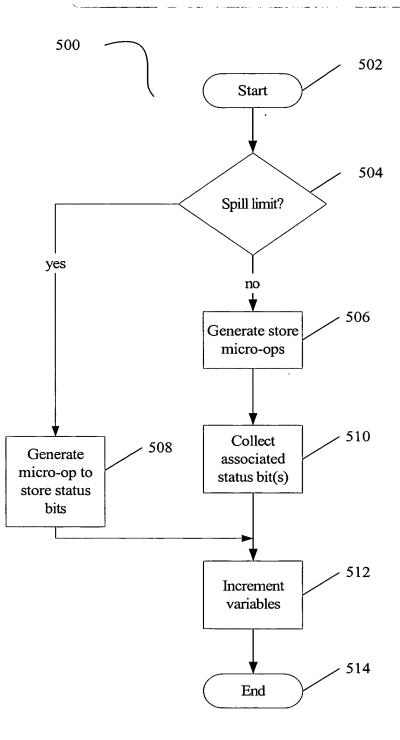


Fig. 5

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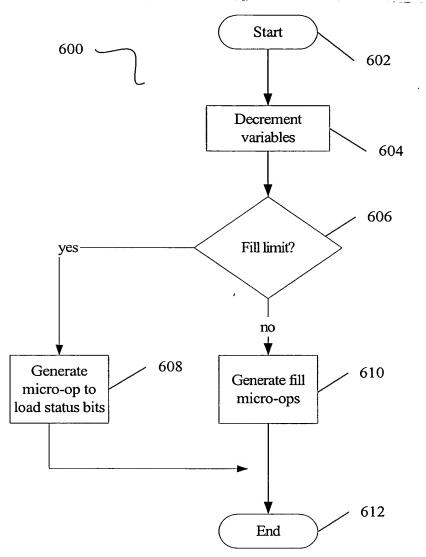


Fig. 6

Title: METHOD AND APPARATUS FOR REGISTER STACK IMPLEMENTATION USING MICRO-OPERATIONS 1st Named Inventor: Edward T. Grochowski Express Mail No.: EV325527927US Docket No.: 42P15758 Sheet: 7 of 11 Start 700 702 704 706 Assign general register contents to Spill limit? half of temp variable, \mathbf{x} 708 Generate micro-op(s) to yes merge status bit into status collection variable (RNAT) 712 Store RNAT contents to temp variable, x 710 714 Assign low half of Even add. and not doublewide temp Yes last iteration? variable = xno 716 718 Odd Assign high half of doublewide temp add. and not first variable = xiteration? 720 722 no Generate double-wide spill micro-ops(s) Generate single-wide spill microops(s) 724 Increment variables 726 Fig. 7 End

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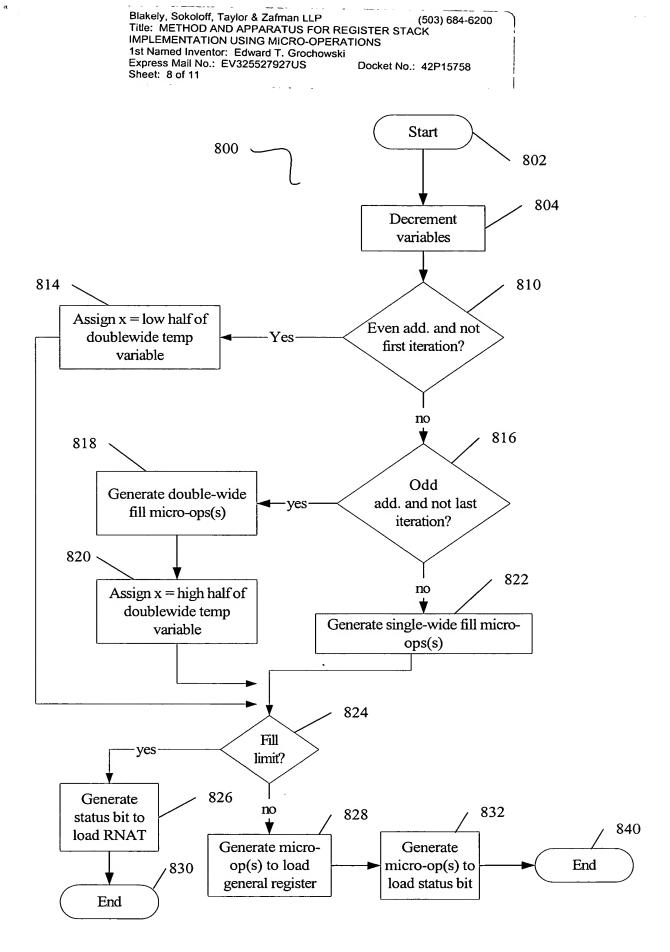


Fig. 8

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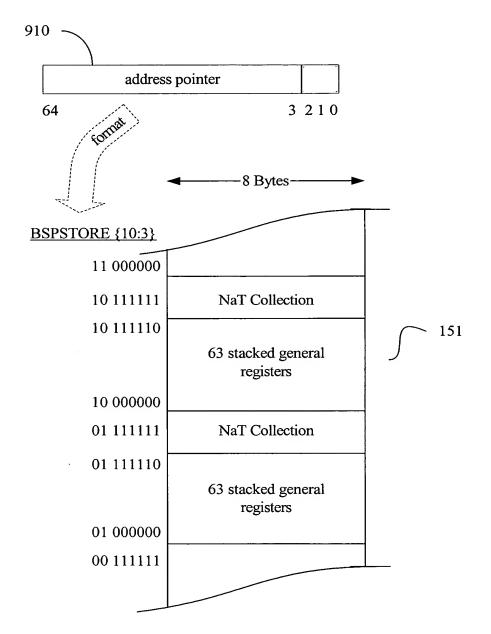
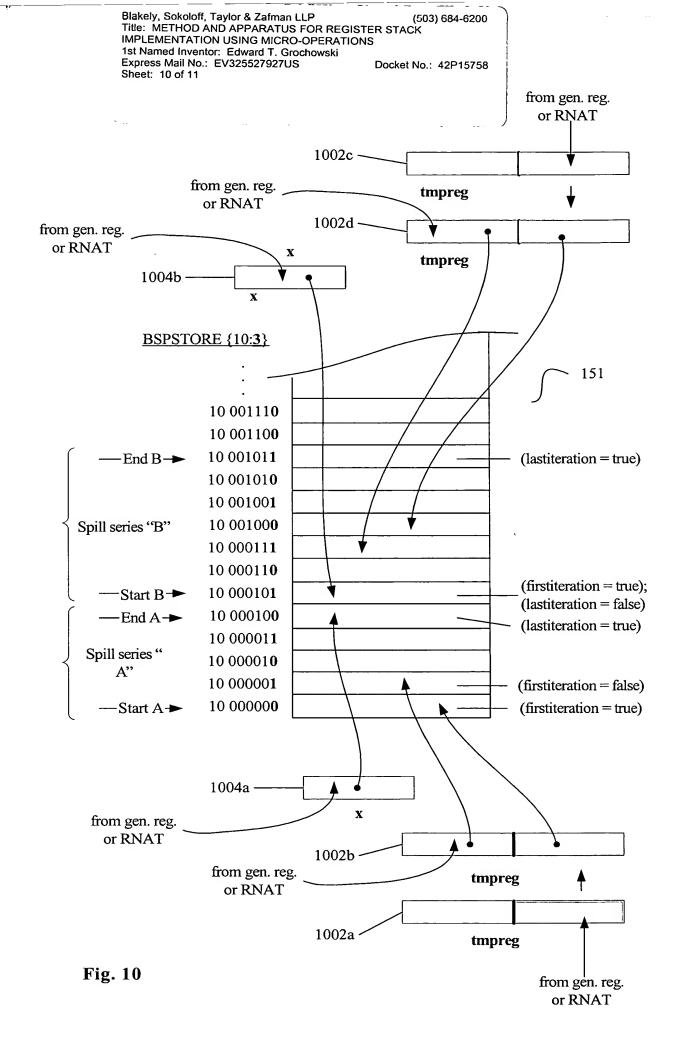


Fig. 9



1st Named Inventor: Edward T. Grochowski Express Mail No.: EV325527927US Docket No.: 42P15758 Sheet: 11 of 11 to gen. reg. or RNAT \mathbf{x} to gen. reg. or RNAT 1104b 1104a X 1102a tmpreg to gen. reg. 1104c or RNAT \mathbf{x} BSPLOAD {10:3} 151 10 001110 10 001100 (firstiteration = true); 10 001011 -Start B-► (lastiteration = false)10 001010 10 001001 (firstiteration = false) Fill series "B" 10 00100**0** 10 000111 10 00011**0** (lastiteration = true) 10 000101 -End B→ (firstiteration = true); 10 000100 —Start A→ (lastiteration = false) 10 000011 10 000010 Fill series "A" 10 000001 10 00000**0** (lastiteration = true) End A→ 1104d to gen. reg. or RNAT 1102b X tmpreg to gen. reg. or RNAT 1104e to gen. reg. or RNAT X Fig. 11 1104f -

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